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FMPC ENVIRONMENTAL VOCABULARY

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FACT SHEET

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RI/FS

The environmental management and response field has created a unique vocabulary of agencies, laws, and terminology. The terms included in this vocabulary fact sheet are often used when discussing the Remedial Investigation and Feasibility Study (RI/FS) now underway at the Feed Materials Production Center (**FMPC**) a facility located near Fernald, Ohio and operated by the U.S. Department of Energy (**DOE**)

The RI/FS, which is discussed in periodic community meetings and described in **FMPC** publications, is a comprehensive, two-phase study to determine the extent of pollution at the **FMPC** and to evaluate alternatives for the best ways to clean it up. The Remedial Investigation (RI) phase is the scientific study of local water, soil, sediment, air, plants and animals, to identify *contaminants* of concern, their location and quantities. The Feasibility Study (FS) phase identifies and evaluates *remediation* alternatives and, in the draft and final FS report, recommends a preferred alternative.

Terms that appear in bold italics are defined elsewhere in this fact sheet.

Administrative Record--A required, comprehensive file of RI/FS and *Removal Action* documents that forms the basis of decisions made regarding cleanup at the **FMPC**. It is available for public review and comment in specified **FMPC** reading rooms.

air monitoring station--Equipment that continuously pulls air through a series of filters to measure the air quality at stations located both on and off **FMPC** property. There are several *air monitoring stations*.

ALARA (As Low As Reasonably Achievable)--The philosophy of keeping radiation emissions and exposures to levels set as far below regulatory limits as is reasonably possible in order to protect public health and the environment. This concept often applies to cleanup activities.

alpha emitter--Any *radioactive* substance (such as uranium) that releases an alpha particle (a pair of two protons and two neutrons) when it decays. Alpha radiation is easy to protect against because it is readily stopped by any thin layer, such as clothing. *Alpha-emitters*, however, are harmful if they are inhaled or ingested and become lodged in body tissues where the radiation can cause tissue damage and possibly cancer.

aquifer--A water-saturated rock layer or zone through which *ground water* can flow in usable quantities. Local public water supplies come from area *aquifers*.

ARARs (Applicable or Relevant and Appropriate Requirements)--A comprehensive set of laws and regulations that are relevant to guide the selection of cleanup activity at a particular site.

2742 ASI (Advanced Sciences Incorporated)-- An independent environmental firm contracted by the *DOE* to perform the RI/FS at the *FMPC*. Two subcontractors assist *ASI* with the RI/FS: International Technology Corporation (IT Corporation) and Pennsylvania Drilling Company.

background levels--An often-used phrase that describes the quantity of any naturally-occurring element (such as uranium or lead) in a specific location. The RI helps to determine whether the amounts present have increased. For soil, the *background level* for uranium in Ohio is between 1.5 and 4.4 *picocuries*/gram. Soil in general can range from 0.3 to 50.0 *picocuries*/gram with higher values occurring in rocky soils. Ohio *background levels* for uranium in water are 1-3 micrograms/liter (1-3 *parts per billion*) which equals 0.7-2.0 *picocuries*/liter.

BDN (Biodenitrification)--A waste water treatment process used at the *FMPC* in which bacteria "eat" nitrates, converting them to nitrogen gas. High concentrations of nitrates in drinking water are a health risk.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act of 1980)--The federal law that guides the clean up of hazardous waste sites. *CERCLA* sets the framework for the RI/FS at the *FMPC*. Also known as "Superfund," it defines hazardous waste, establishes federal authority to respond and clean up waste sites, creates the Hazardous Substance Trust Fund (Superfund), and establishes liability for *remediation* and recovering cleanup costs. *CERCLA* was reauthorized in 1986 (see *SARA*).

consent decrees--Signed agreements between the *DOE* and the *OEPA* that define the role of the *OEPA* and mandate specific environmental improvements at the *FMPC*.

contamination--The addition of foreign materials or chemicals into the environment (soil, sediment, water, or air) in significant concentrations .

CRP (Community Relations Plan)--A site-specific, approved plan that describes how communities affected by the *FMPC* will be informed and involved in the RI/FS. As part of *CERCLA/SARA*, the *DOE* must include the public in the exchange of information concerning the site and provide for public involvement in the decision-making process. The *CRP* for the RI/FS being done at the *FMPC* was approved in May 1988. Revisions reflect changing community information needs as the RI/FS progresses.

daughter product--An element formed by the *radioactive* decay of another element. Oftentimes, *daughter products* are themselves *radioactive*, and they decay further. In this manner, a *radioactive* element, like uranium, may have numerous *daughter products*.

DOE (Department of Energy)--An agency of the federal government responsible for the production of weapons-grade nuclear materials for national defense needs and for researching past, present, and future energy needs of the United States. The *DOE* owns the *FMPC*.

EE/CA (Engineering Evaluation and Cost Analysis)--The report of an assessment process that (1) identifies an environmental problem that requires attention in the near future, (2) develops solutions and recommends the most thorough and cost-effective method to clean up the problem as part of a *Removal Action* at the *FMPC*. EE/CAs are not always required for *Removal Actions* that are considered high priority.

EIS (Environmental Impact Statement)--An environmental study required by *NEPA* to determine if a specific proposed federal action has significant environmental impact.

EMR (Environmental Monitoring Report)--An annual *FMPC* publication that contains technical environmental data about air, soil, sediment, *ground water* and surface water at the *FMPC*. Copies of the *EMR* are available in the *FMPC reading rooms*.

epidemiological study--An analysis of the history of illness in a specific area to identify any significant trends. The accuracy and reliability of such a study depends on the accessibility of health records, movements of populations in and out of the community, and the difficulty of establishing documentable trends and causes.

FFCA (Federal Facilities Compliance Agreement)--A 1985 agreement between the *DOE* and the *US EPA* to set agendas and define responsibilities of each agency regarding the environmental study and cleanup of the *FMPC*.

FMPC (Feed Materials Production Center)--A *DOE* plant that processes uranium. The uranium metal products, or "feed materials" are an integral part of the national defense program. Built in 1951, the *FMPC* occupies 1,050 acres of land near Fernald, Ohio.

ground water--Water that is located below the land's surface.

half-life--The time it takes for half of a *radioactive* substance to decay into its *daughter products*. Elements with shorter half-lives have higher decay rates.

migration--The movement of *contamination* through an *aquifer*.

NEPA (National Environmental Policy Act of 1969)--A federal law that imposes environmental responsibilities on all federal agencies to operate in a manner that is as environmentally sound as is possible. *NEPA* also mandates that when any major federal action has the potential to result in significant environmental impact(s), the impact(s) must be documented and evaluated with an *EIS*.

NLO (National Lead Company of Ohio)--The company that operated the *FMPC* for the *DOE* from the plant's opening in 1954 to 1986.

NPDES (National Pollutant Discharge Elimination System)--A permit system established under the federal Clean Water Act regulating all *point source* discharges of pollutants into streams and waterways. It requires those discharging wastes into waterways to use the best possible pollution control technology currently available to protect public health and water quality. It is enforced by the *US EPA* as well as the *OEPA*. The *FMPC* is subject to *NPDES* regulations.

ODH (Ohio Department of Health)--An agency of the State of Ohio that consults with the *FMPC* on issues of radiological health. The *ODH* has sampled *ground water* and soils around the site, and measured local *radon* levels. In the Fernald area, it is currently conducting monthly radiological tests of ground and surface water, sediments, and locally produced milk.

OEPA (Ohio Environmental Protection Agency)--The Ohio agency providing state oversight of the RI/FS at the *FMPC*, the *OEPA*'s specific role is defined in *consent decrees* with the *DOE*. The *OEPA* has authority to enforce *NPDES* rules at the *FMPC*.

operable units--The six areas of study in the *FMPC* RI/FS that represent differences in types of waste, problems addressed, regulatory requirements, and types of remedial action technologies anticipated. The areas are: (1) Waste Storage Pits, (2) Solid Waste Units, (3) Facilities and Suspect Areas, (4) K-65 silos, (5) Environmental Media (soil and water near the plant), (6) South Plume.

parts per billion--The measure of a substance's concentration in water. Equivalent to one milligram of a substance dissolved in 1000 liters of water or 1 1/3 ounces per 100,000 gallons. Parts per million is the equivalent of one milligram dissolved in one liter of water or 1 1/3 ounces in 1,000 gallons. *Background levels* of uranium in Ohio water are 1 to 3 mg/1,000 liters or 1 to 3 parts per billion.

perched ground water--Water beneath the surface that is in a zone isolated from an *aquifer* by an impermeable layer such as clay; can be thought of as a *ground water* "pond" that is "perched" over the top of a slow flowing *ground water* "river."

permeability--The degree to which rock or soil is capable of allowing *ground water* to flow through it.

picocuries--A unit measuring *radioactivity*. A *picocurie* is approximately equivalent to two *radioactive* disintegrations per minute. Average *background levels* in Ohio are between 1.5 and 4.4 *picocuries* per gram of soil.

piezometer--A small diameter well used primarily to measure *ground water* levels.

plume--A zone or area of *contamination* in an *aquifer*.

point source--Water pollution that comes from a single location, such as the discharge pipe of a waste treatment facility. All *point sources* fall under *NPDES* regulation.

RA (Risk Assessment)--A study, based on findings of the RI, that links scientific data about site contamination with population information. Its goal is to evaluate and estimate risks to public health and safety associated with each remedial action option. Several RAs are being performed at the *FMPC*.

radioactivity--The property of an element that is unstable and spontaneously decays (disintegrates), giving off energy. *Radioactive* materials naturally occur in nearly everything on the earth, including human bodies. *Radioactive* elements in high concentrations, however, pose health risks.

radon--A naturally-occurring *radioactive* gas with a *half-life* of 3.8 days. *Radon* occurs as a byproduct (*daughter product*) of radium decay. It poses health risks because *radon* and its *radioactive daughter products* can be readily breathed into the lungs where they can attach to lung tissue and possibly cause cancer.

RCRA (Resource Conservation and Recovery Act of 1976)--A federal environmental law designed to account for and ensure proper management of hazardous wastes. It requires *US EPA* to regulate all aspects of hazardous waste, beginning after waste is generated, following through transportation and storage, all the way to final disposal in an approved and licensed site. *RCRA* also requires the *US EPA* to establish regulations concerning underground storage tanks.

reading rooms--Locations where documents relating to the *FMPC* RI/FS can be reviewed and commented on. *FMPC reading rooms* are located at the *FMPC* and at several locations in the area.

Remedial Action--Long-term cleanup activities that are identified in the FS *ROD*.

remediation--The actual long-term cleanup of a site to restore it to acceptable standards.

Removal Actions--Near-term cleanup activities that are identified as needed to prevent hazardous waste from *migrating* or traveling to a larger area, or further affecting public health and the environment.

ROD (Record of Decision)--Part of the RI/FS process, it identifies the selected method for long-term cleanup of contamination at a site. The **ROD** is based on technical data and analysis, as well as public input.

SARA (Superfund Amendments and Reauthorization Act of 1986)--Legislation that renewed the statutes in **CERCLA** and strengthened public "right-to-know" provisions.

ten point plan--A strategy outlined by Secretary of Energy James Watkins in 1989, intended to ensure the **DOE's** accountability for the protection of the environment, and public health and safety at **DOE** facilities. It opens **DOE** facilities to greater state monitoring, creates **Tiger Teams** to evaluate environmental compliance at **DOE** facilities, streamlines access to *epidemiological* data for research, and appropriates an additional \$300 million for cleanup activities.

thorium--A naturally-occurring *radioactive* element that is stored at the **FMPC**. It poses potential health risks due to its own radioactivity, as well as that of its *daughter products*.

Tiger Teams--Groups of **DOE** and contractor technical staff created by **DOE** Secretary James Watkins in 1989. They are charged with reviewing operations, documentation, agreements, planning, and facility performance in complying with environmental regulations.

till--A mixture of gravel, sand, and clay deposited by prehistoric glacial activity. This material covers much of the land in the area of the **FMPC**. The amount of clay in the mixture determines how well water can flow through it (see *permeability*).

uranium--A naturally-occurring *radioactive* element that was processed at the **FMPC**. It poses potential health risks due to its own radioactivity, as well as that of its *daughter products*.

US EPA (United States Environmental Protection Agency)--The federal agency that acts as a guardian of the public health and the environment. The **US EPA** role at the **FMPC**, as defined in the **FFCA**, ensures that all cleanup activities at the **FMPC** comply with **CERCLA**, **SARA**, **RCRA**, and **NPDES** regulations.

water table--The depth at which *ground water* that is open to the atmosphere is found.

WMCO (Westinghouse Materials Company of Ohio)--The government contractor that has operated the **FMPC** for the **DOE** since 1986.
